RESIDENT HUNTER HARVEST STUDY

SUMMARY REPORT

NORTHWEST TERRITORIES

1987/88

Northwest Territories Renewable Resources

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GOVERNMENT OF THE NWT

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ABSTRACT

Resident big game hunters of the Northwest Territories have been surveyed annually since 1981 to gain information regarding their harvest of wildlife. In July, 1988, 2091 hunters were sent the 1987/88 hunter harvest questionnaire. Two further mailings, at six week intervals, were sent to hunters for which either a questionnaire or postal return had not yet been received by the Department of Renewable Resources. At the completion of the three waves of mailings, 1589 (76%) hunters had responded to the survey and unopened postal returns were received for 241 hunters.

Respondents reported a harvest of 1432 barren ground caribou, 137 moose, 38 woodland caribou and 22 black bears. Fourteen Dall's sheep were reported taken, 12 of which had full-curls. There were no kills of mountain goat reported. Wolf and wolverine harvest was 28 and 4 animals respectively. Total reported gamebird harvest was 14782 birds, and 43.4% were ptarmigan.

Barren ground caribou estimated kill was calculated by linear regression (2240), and ratio method (2214). Estimated harvest, using the ratio method, was 209 moose, 63 woodland caribou, 34 black bear and 22 Dall's sheep.

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INTRODUCTION

The ability to make wildlife management decisions is dependent upon access to reliable estimates of mortality, recruitment and the current population levels for a given species. One objective of the resident hunter survey is to provide a reliable estimate of harvest by resident big game hunters. In addition to the resident hunter harvest mortality, managers also require kill estimates by non-resident hunters and by the native population hunting in the Northwest Territories (NWT). Non-resident hunter harvest is monitored through outfitter reporting procedures, native subsistence harvest is assessed through co-operative studies with the regional native organizations and commercial harvest is monitored by Department staff.

The barren ground caribou harvest by resident hunters represents approximately 4% of the total annual native subsistence harvest (Grant-Francis pers. comm.). As such, the results of the resident hunter survey may be more valuable in providing long-term data that could provide an indication of changes in harvesting trends, such as increase or decrease in success rate for selected species, or in the effort required to make a kill. The survey could also permit comparison of hunting patterns between, and within, Wildlife Management Zones (WMZ), regions, seasons and years, and be available for assessing the importance of big game species to the non-native residents of the NWT.

Since 1981, the Wildlife Management Division, Department of

Renewable Resources, has conducted an annual mail survey to gather harvest information from resident hunters of big game. The initial questionnaire for 1980/81 was sent only to those hunters living in the Fort Smith and Inuvik regions (Figure 1), where 633 of the total 1396 NWT big game resident hunters resided. Harvest information for the 1981/82 hunting season was gathered by mailing questionnaires to a sub-sample of hunters from all regions in the NWT, with questionnaires sent to 672 of the total 1820 hunters. The questionnaire was sent to all 1895 hunters in 1982/83 and has been sent to all hunters in each year since that time. Response rate of hunters ranged from 61.6% in 1981/82 to 76% in 1987/88.

In all years, information pertaining to hunts for the following big game species was requested: barren ground caribou (Rangifer tarandus groenlandicus), woodland caribou (Rangifer tarandus caribou), black bear (Ursus americanus), moose (Alces alces), Dall's sheep (Ovis dalli) and mountain goat (Oreamnos americanus). In most years, hunt information was also sought for upland gamebirds killed by persons who purchased a big game licence, and for two furbearer species, wolf (Canis lupus) and wolverine (Gulo gulo).

There are four other species classified as big game animals by the Department of Renewable Resources but which are not included on the hunter questionnaire. Grizzly bear (Ursus arctos), polar bear (Ursus maritimus), muskoxen (Ovibos moschatus) and bison (Bison bison) harvests are monitored through other departmental programs.

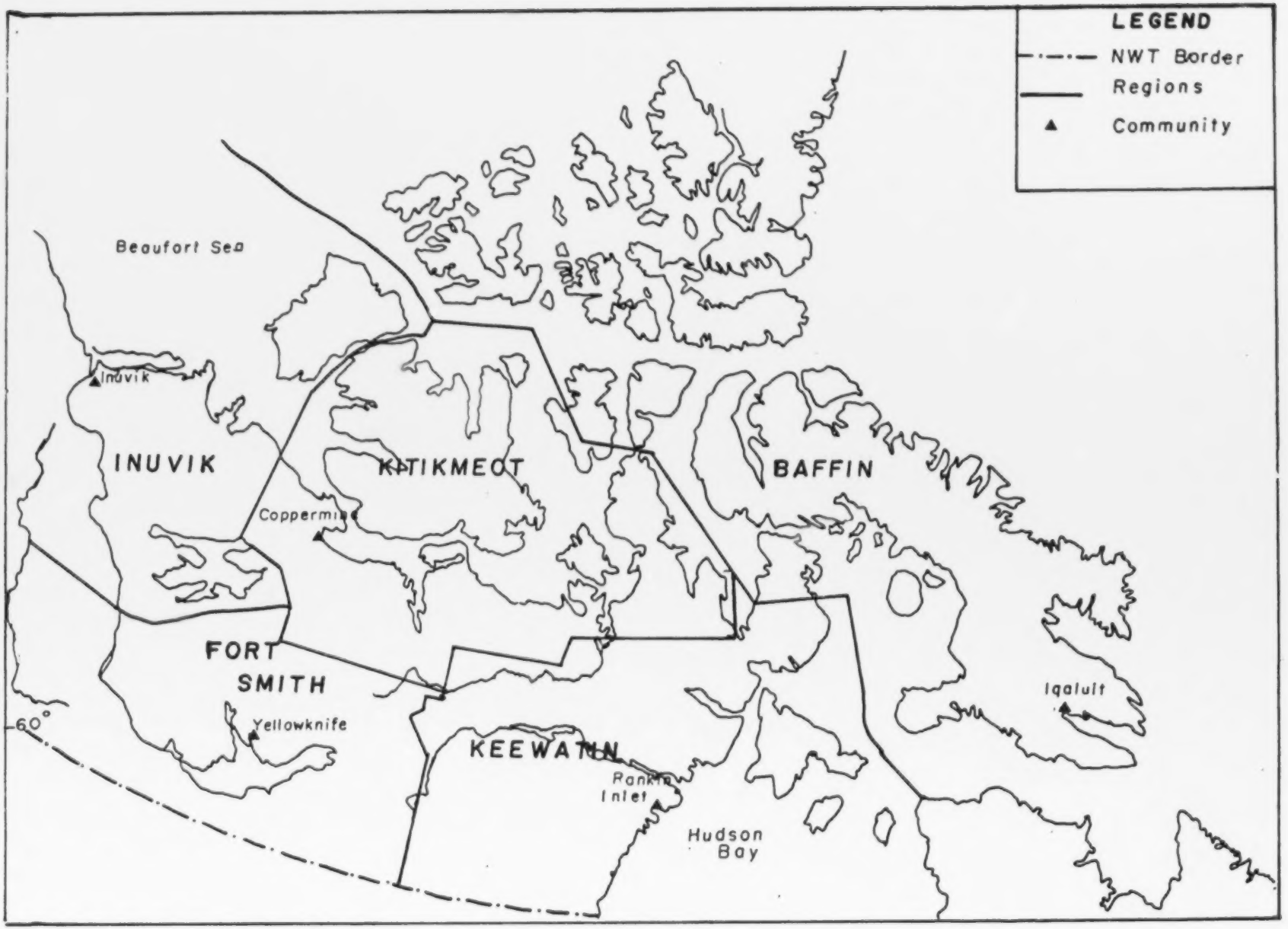

Figure 1. Regions in the Northwest Territories

METHODS

At the end of the 1987/88 hunting season, records of all residents who purchased a big game licence were copied from the Finance and Administration Division vendor sales database to the resident hunter database in the Wildlife Division. Unlike past years, due to computer database incompatibility, individual hunter data for gamebird, wolf and wolverine licence sales were not provided in 1987/88. A total count of the number of gamebird licences sold to NWT resident hunters, as well as the total number of persons paying fees to harvest wolves or wolverine, was provided by Finance and Administration at a later date.

In mid-July, 1988, a letter and questionnaire were sent to each hunter who had purchased a big game licence during the 1987/88 hunting season, i.e., between July 1, 1987 and June 30, 1988 (Appendix A). At the beginning of September, six weeks following the "first wave" mailing, a second letter and questionnaire were sent to each person from whom a returned questionnaire or postal returned letter had not yet been received. In October, approximately six weeks after the "second wave" mailing, a third and final mailing was made to the remaining non-respondents.

Hunters were asked to provide information on the number of days spent hunting and the location of hunt, as well as kill information where applicable. Hunters were asked to complete the form whether they were successful in their hunt or not.

Questionnaires returned after March 15, 1989 were not included

in the resulting summary.

All harvest information was entered onto the database and the reported harvest of big game species was used to estimate the total resident harvest, by region, for the NWT. Residents of Yellowknife were classed as a separate region, region 6, due to the large number of hunters residing in the city. Estimated total harvest for wolf, wolverine and gamebird species was not calculated since only partial information was available.

The ratio method was used to estimate total harvest of each big game species. In addition to the ratio method, simple linear regression analysis was used to determine the estimated harvest for barren ground caribou. The first method assumes that there is no difference between hunter success of non-respondents and non-deliverables, and the respondents (Hawn and Ryel 1969). The second calculation assumes there is a difference between non-respondents and respondents and is an attempt to weight against that bias (Filion 1976).

RESULTS

Returns

Unopened postal returns were received for 241 (11.5%) of the total 2091 hunters who were sent the 1987/88 questionnaire. Of the remaining 1850 hunters, 1589 (85.9%) hunters responded, for an overall response rate of 76.0%. There were 261 (12.5%) people who received the questionnaire but did not respond.

The rate of return for questionnaires was similar for all regions, except Baffin. A high rate of reporting in the "third wave" for that region (Table 1) is suspected to be the result of mailing problems. A number of incorrect addresses were assigned for residents of the Baffin Region and those persons likely did not receive a questionnaire until the mistake was noted and corrected, prior to the third wave mailing.

The level of care taken by respondents in filling out questionnaires varied. Some hunters provided all required information while others answered "yes" to hunting but gave no indication of success, hunt area, or effort given to hunting. Few people filled in the Wildlife Management Zone (WMZ) column.

Tag Sales

In 1987/88 there were 2091 hunters in total, and a total sale of 3947 barren ground caribou tags (Table 1). The bag limit for

Table 1. Number of tags sold and tags accounted for by each wave of returns, NWT, 1987/88.

Region	Barren ground caribou	Woodland caribou	Moose	Black bear	Mtn goat	Dall's sheep
FORT SMITH						
wave 1	81	92	153	40	3	6
wave 2	90	83	137	29	2	7
wave 3	15	40	59	12	0	0
return:	186	215	349	81	5	13
purchase:	241	377	573	132	7	22
INUVIK						
wave 1	124	46	65	18	1	20
wave 2	49	10	22	10	0	4
wave 3	23	4	10	3	0	3
return:	196	60	97	31	1	27
purchase:	314	89	157	46	1	41
KITIKMEOT						
wave 1	50	1	3	1	0	1
wave 2	24	0	0	0	0	1
wave 3	14	0	0	0	0	0
return:	88	1	3	1	0	1
purchase:	100	1	3	2	0	2
KEEWATIN						
wave 1	87	0	0	0	0	0
wave 2	52	0	0	0	0	0
wave 3	5	0	0	0	0	0
return:	144	0	0	0	0	0
purchase:	203	0	0	0	0	0
BAFFIN						
wave 1	39	2	2	2	0	1
wave 2	26	0	0	0	0	0
wave 3	120	0	0	0	0	0
return:	185	2	2	2	0	1
purchase:	317	3	4	1	0	1
YELLOWKNIFE						
wave 1	942	111	218	69	0	6
wave 2	551	83	142	42	2	5
wave 3	240	37	67	20	0	0
return:	1733	231	427	131	2	11
purchase:	2772	381	657	207	2	18
GRAND TOTAL TAG RETURNS	2532	509	878	246	8	53
GRAND TOTAL TAG SALES	3947	851	1394	388	10	84

barren ground caribou is five animals (except for in Wildlife Management Zones A/1 and B/1, where a limit of two is in place), accounting for the larger number of tags. For all other big game species only one animal can be killed by any one licence holder for a given year.

Seven hunters were recorded as having purchased more than the five tag limit. Two people purchased six tags, three purchased seven tags and two bought eight tags each. The licence numbers were checked by Finance and Administration Division and these additional tags were due to "lost tags" being replaced by hunters.

The number of barren ground caribou tags available was increased from three to five per hunter for the 1987/88 harvest year. In 1987/88, an average of 3.1 tags were purchased by each of 1282 caribou hunters, with an average purchase of 1.8 tags for all hunters (Table 2). Of the caribou hunters, 163 (12.7%) people bought one tag, 347 (27.1%) bought 2 tags, 368 (28.7%) purchased 3 tags, 48 (3.7%) bought 4 tags and 356 (27.8%) bought 5 tags each (Table 2). In the previous harvest year 1073 caribou hunters purchased an average of 2.6 tags each; 125 (11.7%) bought only one tag, 31 (29.7%) purchased 2 tags and 629 (58.6%) purchased 3 tags.

An unlimited number of wolves can be taken by each person who has purchased a wolf licence. In the 1987/88 harvest year, 238 big game hunters purchased a licence to harvest wolves.

In 1987/88, 63 big game hunters purchased a wolverine licence, with a bag limit of one per hunter.

Table 2. Comparison of barren ground caribou tag sales between the 1986/87 and 1987/88 harvest years, NWT.

	1986/87	1987/88
Bag limit	3	5
Number of caribou hunters	1073	1282
Number of tags sold	2650	3947
Average number tags/caribou hunter	2.6	3.1
Hunters purchasing		
... 1 tag	125 (11.7%)	163 (12.7%)
... 2 tags	319 (29.7%)	347 (27.1%)
... 3 tags	629 (58.6%)	368 (28.7%)
... 4 tags		48 (3.7%)
... 5 tags		356 (27.8%)

One thousand, seven hundred and thirty-eight hunters who had purchased a big game licence also purchased a gamebird licence. Total number of gamebird licences sold in the NWT was 3520.

Reported Harvest

The two most frequently hunted and killed big game species were barren ground caribou and moose (Table 3). The least harvested species was mountain goat with 8 respondents reporting no kills.

Hunters from the Fort Smith, Inuvik, Keewatin, and Yellowknife regions killed wolves, while only three hunters, all from Yellowknife, reported killing wolverines (Table 3). Kills in excess of the allowable limit were recorded for moose, wolverine,

Table 3. Reported harvest by resident big game hunters, NWT, 1987/88.

REGION	Barren ground caribou	Wood land caribou	Moose	Black bear	Mtn goat	Dall's sheep	Wolf	Wolv-erine
Ft. Smith	136	18	60	7	0	2	7	0
Inuvik	65	11	16	2	0	8	2	0
Kitikmeot	65	0	1	0	0	0	0	0
Keewatin	67	0	0	0	0	0	4	0
Baffin	76	0	0	0	0	0	0	0
Yellow-knife	1023	9	60	13	0	4	15	4
Total	1432	38	137	22	0	14	28	4

woodland caribou and black bear. Two persons each recorded killing four moose, and one hunter claimed a kill of three animals. One hunter recorded killing two woodland caribou, one hunter recorded two black bear kills, and a single hunter reported killing two wolverines. Original questionnaires were checked to verify these records and the data indicated that the hunter reports had been entered on the database correctly. This information is treated as confidential by the Wildlife Management Section, consequently no enforcement procedures were initiated.

Of the persons who completed the questionnaire, 529 reported making a caribou hunt. There were 292 hunters who purchased a barren ground caribou tag, and returned their questionnaire, but who did not provide any hunt data. These persons may not have

hunted, or may have returned incomplete questionnaires. The reported caribou kill by respondents was 1432 animals, for an average kill of 2.7 barren ground caribou per respondent who reported taking part in a caribou hunt. Mean kill for all respondents was 1.1 animals. In 1986/87, 415 respondents reported hunting caribou, with an average success of 1.87 animals each. Average barren ground caribou kill for all respondents in that year was 0.6 animals.

Of the 14 reported successful Dall's sheep kills, 12 animals had full curls. No data was provided for the other two animals. Four of the sheep hunters indicated that their method of transportation was backpacking, two people reported backpacking in combination with aircraft or helicopter, six persons used helicopters only, and one person used aircraft as the method of transport.

A total of 14782 gamebirds, 6412 (43.4%) of which were ptarmigan and 56.6% other grouse species, were reported harvested by resident big game hunters (Table 4). Reported game bird harvests show a ratio of 5.6:1 spruce grouse (Dendragapus canadensis) harvested per ruffed grouse (Bonasa umbellus) in the Yellowknife region (Table 4). This ratio is, however, suspected to be low. The ruffed grouse range is primarily limited to the area west of the Mackenzie River, and sightings in the Yellowknife region are therefore rare. A ratio of closer to 25:1 spruce grouse per ruffed grouse would be expected, and it is likely that hunters are misidentifying these two due to the similarities in their

Table 4. Reported upland gamebird harvest by resident big game hunters, NWT, 1987/88.

COMMUNITY	SPRUCE GROUSE	RUFFED GROUSE	SHARP-TAILED GROUSE	PTARMIGAN
Ft. Liard	6	10	6	0
Ft. Resolution	12	0	0	30
Ft. Simpson	509	330	146	245
Ft. Smith	649	582	205	610
Hay River	1017	343	415	726
Lac La Martre	0	0	0	0
Pine Point	211	66	57	198
Snowdrift	1	0	0	1
Wrigley	20	10	6	20
FORT SMITH REGION:	2425	1341	835	1830
Aklavik	0	0	0	20
Ft. Franklin	3	0	0	30
Ft. Good Hope	0	0	2	4
Ft. McPherson	20	0	0	0
Ft. Norman	10	0	6	25
Inuvik	79	30	34	753
Normal Wells	142	45	177	322
Tuktoyaktuk	0	0	0	155
INUVIK REGION:	254	75	219	1269
Cambridge Bay	0	0	0	92
Coppermine	0	0	0	5
Gjoa Haven	0	0	0	0
Spence Bay	0	0	0	0
KITIKMEOT REGION:	0	0	0	97
Baker Lake	0	0	0	42
Chesterield Inlet	0	0	0	0
Arviat (Eskimo Pt.)	0	0	0	113
Rankin Inlet	0	0	0	18
Repulse Bay	0	0	0	0
KEEWATIN REGION:	0	0	0	173
Arctic Bay	0	0	0	0
Cape Dorset	0	0	0	0
Igloolik	0	0	0	0
Iqaluit	0	0	0	119
Lake Harbour	0	0	0	25
Nanisivik	0	0	0	6
Pangnirtung	0	0	0	2
Pond Inlet	0	0	0	0
Resolute Bay	0	0	0	0
BAFFIN REGION:	0	0	0	167
YELLOWKNIFE REGION:	2341	417	463	2876
GRAND TOTAL:	5020	1833	1517	6412

appearance (Bromley pers. comm.). Eight different hunters reported harvests of birds over 100, with one person claiming a harvest of approximately 600 birds composed of 300 ptarmigan and 100 of each of the remaining three species.

Estimated Harvest

Harvest figures for barren ground caribou, using the ratio method and regression analysis, were estimated to be 2214 and 2241, respectively (Table 5). The regression curves are provided (Appendix B).

The 1987/88 data, when compared with the previous five years of the study, indicate increased harvest of barren ground caribou. There was an estimated harvest of 2,240 animals in 1987/88, 1260 animals in 1986/87 and 660 animals in 1985/86 (Table 6). The 56.2% increase in barren ground caribou harvest between 1986/87 and 1987/88 can likely be attributed to two major influences: the increase in allowable bag limit, as discussed previously; and secondly, the distribution of caribou. The southern limit of the Bathurst herd normally extends to the northwest border of the Fort Smith region, but in 1987/88 was much further southwest, and caribou wintered near the Ingraham Trail and Gordon Lake ice road, making them more accessible to hunters. It is possible that because of this easy access to the herd, persons who normally would not have hunted caribou did so in 1987/88. There was a 19.5% (290) increase in the number of caribou hunters between 1986/87 and

Table 5. *Estimated big game harvest by resident hunters, NWT, 1987/88.

Region	Barren ground caribou	Woodland caribou	Black bear	Moose	Dall's sheep	Mtn. goat
Ft. Smith	176 (169)	32	11	99	3	0
Inuvik	104 (110)	16	3	26	12	0
Kitikmeot	74 (80)	0	0	1	0	0
Keewatin	94 (94)	0	0	0	0	0
Baffin	130 (131)	0	0	0	0	0
Yellowknife	1636 (1656)	15	20	83	6	0
TOTAL:	2214	63	34	209	22	0

* Estimation using ratio method and linear regression.

1987/88. The proportion of harvest taken by Yellowknife hunters increased in 1986 by 7.1%, and decreased or remained constant for all other regions. Yellowknife hunters took 48.6% (766) of the reported caribou harvest in 1986 and 55.7% (1255) in 1987.

In addition to an increase in the number of hunters in 1987/88, there was a higher success rate per caribou hunter, and this factor too may have been influenced by the ready access to the caribou herd. As noted previously, in 1987/88, there was an average success rate of 2.7 barren ground caribou per caribou

Table 6. Estimated big game harvest by resident hunters, NWT, 1982 to 1987/88.

Year/Region	Barren ground caribou	Woodland caribou	Moose	Dall's sheep	Mtn. goat	Black bear
1982/83						
Ft. Smith	52	52	102	14	3	10
Inuvik	44	7	15	9	0	5
Kitikmeot	55	0	1	0	0	0
Keewatin	39	0	0	0	0	0
Baffin	121	0	0	0	0	0
Yellowknife	282	6	51	2	0	28
	593	65	159	25	3	43
1983/84						
Ft. Smith	50	32	92	18	3	11
Inuvik	93	8	27	9	0	4
Kitikmeot	60	0	0	0	0	0
Keewatin	23	0	0	0	0	0
Baffin	131	0	0	0	0	0
Yellowknife	814	10	22	10	0	16
	1171	50	141	37	3	31
1984/85						
Ft. Smith	40	41	94	12	4	23
Inuvik	96	11	24	3	0	4
Kitikmeot	47	0	1	0	0	0
Keewatin	31	0	0	0	0	0
Baffin	95	0	0	0	0	0
Yellowknife	261	7	53	2	0	8
	570	59	172	17	4	35
1985/86						
Ft. Smith	65	36	80	7	3	11
Inuvik	58	13	34	2	0	3
Kitikmeot	55	0	0	0	0	0
Keewatin	61	0	0	0	0	0
Baffin	109	0	0	0	0	0
Yellowknife	312	4	37	7	0	5
	660	53	151	16	3	19
1986/87						
Ft. Smith	81	19	78	8	1	7
Inuvik	73	24	15	6	0	3
Kitikmeot	65	0	0	0	0	0
Keewatin	51	0	0	0	0	0
Baffin	71	0	0	0	0	0
Yellowknife	919	11	14	0	0	1
	1260	54	107	14	1	11
1987/88						
Ft. Smith	169	32	99	3	0	11
Inuvik	110	16	26	12	0	3
Kitikmeot	80	0	1	0	0	0
Keewatin	94	0	0	0	0	0
Baffin	131	0	0	0	0	0
Yellowknife	1656	15	83	6	0	20
	2240	63	209	21	0	34

Total number of hunters: 1982/83 - 1895; 1983/84 - n/a; 1984/85 - 1876; 1985/86 - 1969; 1986/87 - 1867; 1987/88 - 2091

hunter, compared with 1.8 in 1986/87.

Hunting Pressure

The following estimates are based on the "hunt effort" information provided by respondents; however, completion of many of the questionnaires was poor, or non-existent and may limit the reliability of the estimates. This discussion is included to provide a basis for general comparison with future years, and may serve to "ear-mark" potential areas of concern.

In 1987/88, persons holding barren ground caribou tags hunted from zero to a maximum of 30 days, with the average length of the hunt being one day. Harvest ranged from one to five animals per person with an average kill of one animal per hunter. Number of days required for a successful hunt was 1.1 days. These values are similar to those for the 1986/87 hunt year where number of days required to make a kill was 1.2, and the average number of hunt days and average number of kills per hunter was 1. In 1986/87 the maximum recorded kill was 4 and the maximum number of days hunted was 20.

Persons who purchased a moose tag in 1987/88 hunted an average of 3 days, with minimum hunting time of 0 and maximum hunting time of 102 days. The average time taken to have a successful hunt was 12.8 days, whereas in 1986/87, an average of 13.5 days was needed to make a kill. Persons holding 1986/87 moose tags hunted between 0 and 30 days, with an average of 3 hunting days per person.

Hunters who reported hunting for gamebirds hunted up to a maximum of 60 days, with an average hunt time of 5 days per person.

RECOMMENDATIONS

Questionnaire Forms

Biases in a sociological survey such as this are an inherent part of the survey, though some bias can be minimized through various avenues. Non-response bias will be reduced with increased rate of response and increased rate of response can be encouraged through questionnaire design, and accompanying cover letters which clearly state the purpose of the study and the role of the respondents (Filion 1978). The prototype questionnaire for this survey conformed well to such guidelines, though some minor modifications have been recommended.

The time needed to print new letters and questionnaires required an informal review of the system prior to the writing of this report. The following recommended changes regarding questionnaire design have, therefore, already been incorporated into the 1988/89 study.

1. The low rate of completion of the WMZ column on the questionnaires caused unnecessary time burden on the data input personnel who had to look up WMZ for each location item. To encourage a better completion rate, a WMZ map was provided with the questionnaire.

2. The questionnaire form design was maintained, but with minor adjustments aimed at encouraging better completion

of the forms by hunters. The borders were altered slightly to outline the different species sections and the wording was improved.

3. New letters were prepared for each wave of mailing. Each letter includes an example of how to complete the questionnaire; highlights the need for response by hunters, non-hunters, and hunters who did not make kills; and addresses the cost effectiveness of quick response by hunters.

At the request of the Waterfowl Biologist, Department of Renewable Resources, species additions were made to the 1989/90 questionnaire form. Inclusion of waterfowl harvest by resident big game hunters will provide the waterfowl biologist with new information, and may provide an avenue for a verification study at some future date.

Data

The difference in the two database systems which caused a missed data block concerning wolf and wolverine tag sales can be resolved in future by requesting Finance and Administration to provide an additional listing of big game hunters who also paid for the privilege of hunting either wolf or wolverine. The wildlife data files would have to be edited and appended accordingly.

During the final stage of the 1987/88 resident harvest survey, a number of concerns regarding missed data, data error or misrepresentation of data were noted, some of which were due to high staff turnover and inexperienced data entry personnel. In general there is need for data verification at all stages of the study. Misspelling of community names, or use of an abbreviation not in the community/region look-up table can result in failure to mail some hunters their questionnaires; data entry error may cause extreme or unusual harvest numbers to be generated and they can most easily be rectified if noted and changed prior to generating the tables required for report output; and a count of the number of licences sold will allow deletion of "lost tags" from the database before summation of data begins.

General

Response bias has a more significant effect on estimated harvest values then does non-response bias (Wright 1978, Sen 1973). Inaccurate reporting can be due to "prestige bias", mechanical error, misidentification of species, and memory loss (MacDonald and Dillman 1968), and cannot be corrected for without conducting a simultaneous verification study. The Department of Renewable Resources does maintain caribou check point stations annually, and it is recommended that there be some investigation as to the feasibility of further developing that system to facilitate verification.

Some hunters recorded harvest figures in excess of the allowable bag limit. The continued honesty of hunters must be encouraged by ensuring that the information for an individual (or licence number) is never inadvertently, or purposefully, released for general use. Where reported harvest values are extreme and believed caused by error when completing the questionnaire, it is recommended that those values be removed from the reported harvest.

It is recommended that the resident hunter harvest study be continued in subsequent years. It is the longest running harvest study by the Department of Renewable Resources, and its continuation will allow biologists and managers to document trends in the harvest.

ACKNOWLEDGEMENTS

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Review of the draft report by Mark Williams, Caribou Technician, and the comments provided by him, was appreciated. Alison Welch, Librarian, reviewed the final report.

The efforts of the Finance and Administration Department, in particular of Jan Wouters, are appreciated. The time taken to check data on this department's behalf, usually on short notice, was of great help.

PERSONAL COMMUNICATIONS

Bromley, B. Waterfowl Biologist, Department of Renewable Resources, Yellowknife, NWT

Grant-Francis, D. Harvest Biologist, Department of Renewable Resources, Yellowknife, NWT

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APPENDIX A. 1987/88 Hunter Harvest Questionnaire

1987-88

HUNTER HARVEST QUESTIONNAIRE

DO NOT REMOVE LABEL. QUESTIONNAIRE IS CONFIDENTIAL WHEN COMPLETED.

NOTE:

1. **THIS PERTAINS TO THE JULY 1, 1987 TO JUNE 30, 1988 SEASON ONLY.**
2. **PLEASE COMPLETE AND RETURN EVEN IF YOU DID NOT HUNT IN 1987-88.**
3. **"WMZ"-Wildlife Management Zone.**
4. **This questionnaire will not be used for enforcement purposes.**
5. **Please Print.**

A

BARREN-GROUND CARIBOU HUNTING 1987-88

1. Did you hunt barren-ground caribou in 1987-88? Yes____ No____
   If "no" go to section B.

2. How many did you kill? (please circle) 0 1 2 3 4 5

3.

Hunt location Lat/Long or nearest landmark	WMZ	Month	# Days Hunted	If you killed a caribou Type of Kill Bull	Cow	Juv.	Kill Date (month)

B

MOOSE HUNTING 1987-88

1. Did you hunt moose in 1987-88? Yes____ No____ If "no" go to section C.

2. Did you kill a moose in 1987-88? Yes____ No____

3.

Hunt Location Lat/Long or nearest landmark	WMZ	Month	# Days Hunted	If you killed a moose Type of Kill Bull	Cow	Calf	Kill Date (month)

C

WOODLAND CARIBOU HUNTING 1987-88

1. Did you hunt woodland caribou in 1987-88? Yes____ No____
   If "no" go to section D.

2. Did you kill a woodland caribou in 1987-88? Yes____ No____

3.

Hunt Location Lat/Long or nearest landmark	WMZ	Month	# Days Hunted	If you killed a caribou Type of Kill Bull	Cow	Juv.	Kill Date (month)

MOUNTAIN GOAT HUNTING 1987-88

1. Did you hunt mountain goat in 1987-88? Yes____ No____
   If "no" go to section E.
2. Did you kill a mountain goat in 1987-88? Yes____ No____

3.

Hunt Location Lat/Long or nearest landmark	WMZ	Month	# Days Hunted	If you killed a mountain goat: Type of kill Billy	Nanny	Kill Date (month)

E

BLACK BEAR HUNTING 1987-88

1. Did you hunt black bear in 1987-88? Yes____ No____
   If "no" go to section F.
2. Did you kill a black bear in 1987-88? Yes____ No____

3.

Hunt Location Lat/Long or nearest landmark	WMZ	Month	# Days Hunted	If you killed a black bear: Type of Kill Boar	Sow	Kill Date (month)

F

SHEEP HUNTING 1987-88

1. Did you hunt sheep in 1987-88? Yes____ No____
   If "no" go to section G.
2. Did you kill a sheep in 1987-88? Yes____ No____

3.

Hunt Location Lat/Long or nearest landmark	WMZ	Month Harvested	# Days Hunted	If you killed a sheep: Type of Kill 3/4 curl	full curl	Kill Date (month)

4. Method of transportation (check one): Road____ Aircraft____
   Back pack____ Helicopter____

G

UPLAND GAME BIRD HUNTING 1987-88

1. Did you hunt upland game birds in 1987-88? Yes____ No____
   If "no" go to section H.

2.

Hunt Location Lat/Long or nearest landmark	WMZ	Month	# Days Hunted	How many did you bag? Spruce Grouse	Ruffed Grouse	Sharp-Tailed Grouse	Ptarmigan

H WOLF HUNTING 1987-88

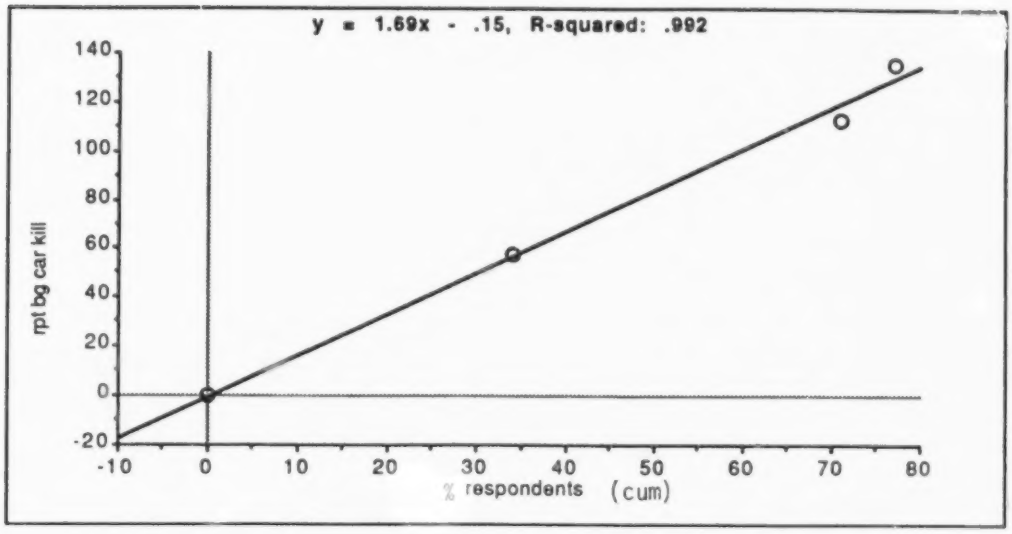
1. Did you hunt wolves in 1987-88?
   Yes____ No____
2. Did you kill any wolves in 1987-88?
   Yes____ No____ How many? ____
3. Where?_____

J WOLVERINE HUNTING 1987-88

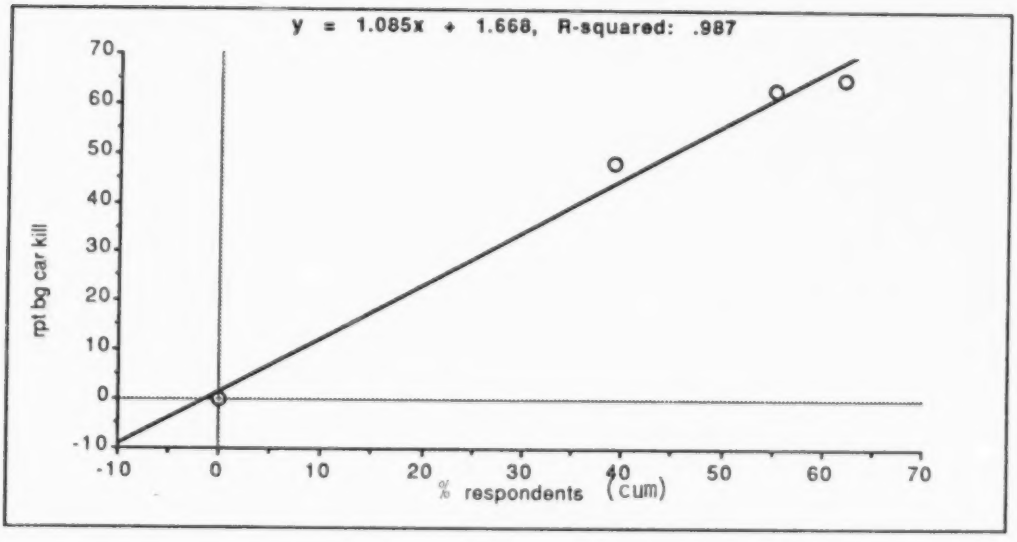
1. Did you hunt wolverines in 1987-88?
   Yes____ No____
2. Did you kill any wolverines in 1987-88?
   Yes____ No____ How many?____
3. Where?_____

APPENDIX B. Regression analysis for estimation of barren ground caribou harvest, by region.

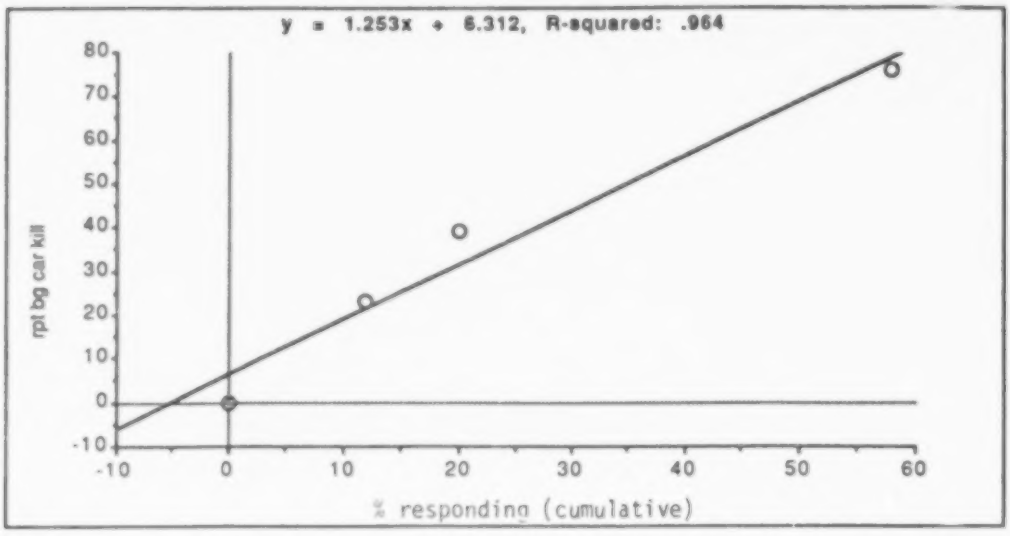
BARREN-GROUND CARIBOU HARVEST, REGION 1, 1987/88



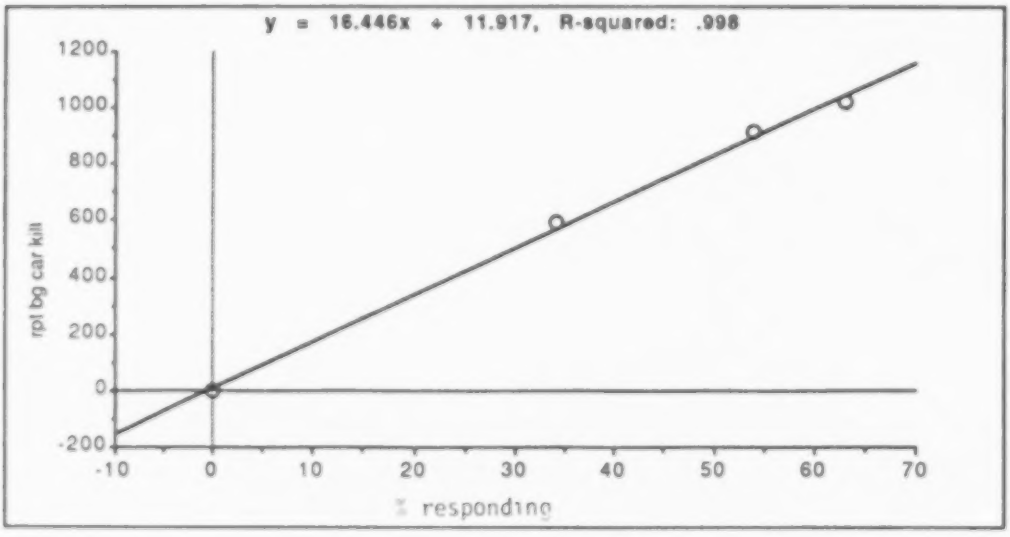
BARREN-GROUND CARIBOU HARVEST, REGION 2, 1987/88



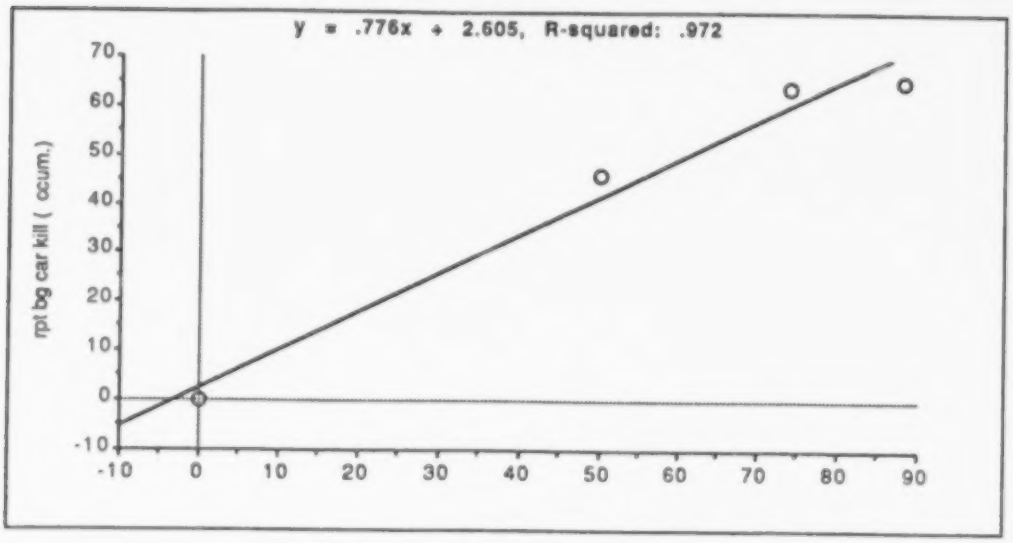
BARREN-GROUND CARIBOU HARVEST, REGION 5, 1987/88



BARREN-GROUND CARIBOU HARVEST, REGION 6, 1987/88



BARREN-GROUND CARIBOU HARVEST, REGION 3, 1987/88



BARREN-GROUND CARIBOU HARVEST, REGION 4, 1987/88